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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/748,619	12/27/2003	Vladimir S. Moxson	0078883-000002	7498

21839 7590 06/23/2011

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EXAMINER	
ZHU, WEIPING	

ART UNIT	PAPER NUMBER
1734	

NOTIFICATION DATE	DELIVERY MODE
06/23/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/748,619	MOXSON ET AL.	
	Examiner	Art Unit	
	WEIPING ZHU	1734	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 May 2011 and 12 November 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2,3,5-14,17,19 and 21* is/are pending in the application.

4a) Of the above claim(s) *5-14* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2,3,17,19 and 21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. In view of the appeal brief filed on May 3rd, 2011, PROSECUTION IS HEREBY REOPENED. New ground of rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

/Emily M Le/

Supervisory Patent Examiner, Art Unit 1734.

Disclosure Objections

2. The disclosure is objected to because of the following informalities:

The contents in the page 1 of the instant specification except for the title of the invention should not be included in the page 1 of the instant specification.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 2, 3, 17, 19 and 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase “in the amount of 50%” in item (b) of claim 21 renders claim 21 and all its dependent claims indefinite because the limitation renders the limitation of a matrix of titanium or titanium alloy as a major component (i.e. greater than 50%) in item (a) of claim 21 indefinite.

The phrase “complex carbide- and/or silicide” in item (c) of claim 21 renders claim 21 and all its dependent claims indefinite because it is unclear whether it means complex carbide and/or complex silicide or complex carbide- and/or complex carbide-silicide. In the list after the phrase “such as", complex carbides (e.g. (Ti,V)C), complex carbide-aluminides (e.g. Ti_3AlC_2), complex carbide-silicides (e.g. Ti_3SiC_2) and carbides (e.g. V_2C) are included. It is noted that there is no complex silicide in the list and the carbides should not be included in the list.

The phrase "such as" in item (c) of claim 21 renders claim 21 and all its dependent claims indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 2, 3, 17, 19 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Brupbacher et al. (US 5,059,490).

With respect to claim 21, Brupbacher et al. ('490) discloses a fully-dense discontinuously-reinforced titanium matrix composite material having superior physical and mechanical properties including high compressive properties, high fracture toughness and excellent creep characteristics comprising (col. 1, lines 25-43, col. 3, lines 23-58, col. 4 lines 3-50, col. 4, line 63 to col. 5, line 8, Examples 3, 7, 8 and col. 7, line 3 to col. 9, line 49):

a. a matrix of a titanium alloy;

b. ceramic hard particles provided as starting particles dispersed in the matrix in an amount of about 24% by weight (Example 7) (the instantly claimed "ceramic and/or intermetallic hard particles" do not require the presence of intermetallic hard particles including Al_8V_5 and the limitation of "50% by volume or less" as instantly claimed does not require the presence of the ceramic hard particles); and

c. complex carbide particles comprising TiVC dispersed in the matrix that are at least partially soluble in the matrix at the sintering or forging temperature (the instantly claimed complex carbide- and/or silicide particles do not require the presence of complex silicide or complex carbide-silicide particles including Ti_3SiC_2).

With respect to claim 2, Brupbacher et al. ('490) discloses that the porosity in the composite material is eliminated (col. 8, lines 1-15), which reads on the claimed discontinuous porosity at the density over 98% form the theoretical value.

With respect to claim 3, Brupbacher et al. ('490) discloses that the matrix alloy is a titanium aluminide (col. 3, lines 48-58).

With respect to claim 17, Brupbacher et al. ('490) discloses that conventional whisker reinforced metal-ceramic composite materials comprise silicon carbide and graphite as whisker materials (col. 1, lines 30-43). Brupbacher et al. ('490) further discloses whisker loadings of from less than 5 to greater than 90 volume percent (col. 4, lines 3-10).

With respect to claim 19, Brupbacher et al. ('490) does not specify the amount of the complex carbide particles as claimed. However, Brupbacher et al. ('490) discloses that the total whisker loadings which would include the complex carbide particle loading range from less than 5 to greater than 90 volume percents (col. 4, lines 3-10), which overlaps the claimed range.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 2, 3, 17, 19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brupbacher et al. ('490) in view of Ferguson (US 7,189,342 B2) and further in view of Knipe et al. (US 5,696,619).

With respect to claim 21, Brupbacher et al. ('490) discloses a fully-dense discontinuously-reinforced titanium matrix composite material having superior physical and mechanical properties including high compressive properties, high fracture toughness and excellent creep characteristics comprising (col. 1, lines 25-43, col. 3, lines 23-58, col. 4 lines 3-50, col. 4, line 63 to col. 5, line 8, Examples 3, 7, 8 and col. 7, line 3 to col. 9, line 49):

a. a matrix of a titanium alloy;

b. ceramic and intermetallic hard particles provided as starting particles dispersed in the matrix in an amount of about 24% by weight (Example 7) (the limitation of "50% by volume or less" as instantly claimed does not require the presence of the ceramic hard particles); and

c. complex carbide and complex carbide-silicide particles comprising TiVC dispersed in the matrix that are at least partially soluble in the matrix at the sintering or forging temperature.

Brupbacher et al. ('490) does not specify the presence of the complex carbide-silicide particles in the titanium matrix composite material as claimed. Ferguson ('342 B2) discloses composite materials comprising Ti_3SiC_2 (col. 11, line 41 to col. 12, line 11). It would have been obvious to one of ordinary skill in the art at the time of the invention to include Ti_3SiC_2 particles in the composite material of Brupbacher et al.

('490) as disclosed by Ferguson ('342 B2) in order to achieve improved properties of the composite material as disclosed by Ferguson ('342 B2) (col. 11, line 41 to col. 12, line 11).

Brupbacher et al. ('490) in view of Ferguson ('342 B2) does not disclose the presence of the intermetallic compound of Al_8V_5 in the titanium matrix composite material as claimed. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the intermetallic compounds of Brupbacher et al. ('490) in view of Ferguson ('342 B2) (e.g. TiAl) with the claimed Al_8V_5 in the titanium matrix composite material of Brupbacher et al. ('490) in view of Ferguson ('342 B2) with an expectation of success, because the intermetallic compounds of Brupbacher et al. ('490) in view of Ferguson ('342 B2) (e.g. TiAl) and Al_8V_5 are functionally equivalent in terms of being used to make an article with improved strength as disclosed by Knipe et al. ('619) (abstract and col. 3, lines 25-57). See MPEP 2144.06.

With respect to claim 2, Brupbacher et al. ('490) discloses that the porosity in the composite material can be eliminated (col. 8, lines 1-15), which reads on the claimed discontinuous porosity at the density over 98% form the theoretical value.

With respect to claim 3, Brupbacher et al. ('490) discloses that the matrix alloy is a titanium aluminide (col. 3, lines 48-58).

With respect to claim 17, Brupbacher et al. ('490) discloses that conventional whisker reinforced metal-ceramic composite materials comprise silicon carbide and graphite as whisker materials (col. 1, lines 30-43). Brupbacher et al. ('490) further

discloses whisker loadings of from less than 5 to greater than 90 volume percent (col. 4, lines 3-10).

With respect to claim 19, Brupbacher et al. ('490) does not specify the amount of the complex carbide particles as claimed. However, Brupbacher et al. ('490) discloses that the total whisker loadings which would include the complex carbide particle loading range from less than 5 to greater than 90 volume percents (col. 4, lines 3-10), which overlaps the claimed range.

Response to Arguments

6. The appellant's arguments in the appeal brief filed on May 3rd, 2011 have been fully considered but they are not persuasive.

The applicant argues that Brupbacher et al. ('490) does not disclose the presence of ceramic and/or intermetallic hard particles and examples of Brupbacher et al. ('490) are devoid of any mentioning of SiC. In response, the examiner notes that Brupbacher et al. ('490) does disclose the presences of ceramic and intermetallic hard particles provided as starting particles (col. 4, lines 25-27 and Examples 3, 7 and 8). Brupbacher et al. ('490) further discloses that conventional whisker reinforced metal-ceramic composite materials comprise silicon carbide and graphite as whisker materials (col. 1, lines 30-43). The rejection was based on the prior art's broad disclosure rather than preferred embodiments. See MPEP 2123.

The applicant's argument directed to Gottselig et al. ('529) and Kugler ('412) are moot in view of new grounds of rejections as discussed above.

Conclusion

7. This Office action is made non-final. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Weiping Zhu whose telephone number is 571-272-6725. The examiner can normally be reached on 7:00-16:30 Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Weiping Zhu/
Examiner, Art Unit 1734
6/10/2011

/Emily M Le/
Supervisory Patent Examiner, Art Unit 1734